Laurel Valley Sugar Plantation: Drainage Plant
2 miles south of Thibodaux on State Route 308
Thibodaux
Lafourche Parish
Louisiana

HAER No. LA-1C

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Historic American Engineering Record
National Park Service
U.S. Department of the Interior
Washington, DC 20240

HAER Laurel Valley Project, Summer 1978

Name: Laurel Valley Plantation, drainage plant

Location: Laurel Valley Plantation
State Route 2 Box K526, off La. Highway 308
Thibodaux, Louisiana

Date of Construction: Drainage Wheel, 1867
Menge Pumps, 1890 - 1921
Centrifugal Pumps, 1920

Present Owner: Laurel Valley Plantation, Inc.

Present Use: Abandoned

Significance: Drainage, as effected through a system of ditches leading back to a pumping plant in the rear of a plantation, was an essential facet of operations on low-lying Louisiana sugar plantations. The systems used at Laurel Valley typify systems found in use throughout Louisiana.

Historian: John C. Rumm
February, 1979

Fifteen thousand years ago the face of the North American continent, vastly different in appearance from what we know today, began to undergo the geological processes that brought about its present form. Across the northern reaches of the continent the last remnants of a great glacial epoch began to recede, while to the south the vast arm of an inland sea, which had extended as far north as present-day Illinois, began to withdraw. As the glaciers receded the action of ice upon rock gouged out numerous lakes, and from one of these northern lakes originated a mighty river whose course would dramatically shape the appearance of the lands through which it flowed. This river, the Mississippi, rushed southward across the central praries formerly covered by the inland sea, and as it flowed the river-gathered up tons and tons of topsoil and vegetable matter. Where the river met the shores of the sea it dropped its alluvial material, building up an extensive deltaic plain. Earthquakes, floods and other processes also caused the river to shift course across this plain, creating "small distributary streams or 'bayous' which often repeated the Mississippi River pattern" of alluvial deposits.[1]

Thus has the Mississippi favored the state of Louisiana. Nearly half of the state lies wholly within this immense (13,000 square mile) deltaic plain. The soils deposited by the river and its bayou tributaries for fifteen millenia "are classed with the most fertile and productive to be found in the world."[2] The combination

of fertile soil and a semi-tropical climate drew settlers to Louisiana who quickly undertook the cultivation of a host of crops including cotton, rice, indigo, corn, and especially sugar cane.

As these planters fanned out across southern Louisiana during the late 18th and early 19th centuries, they found that certain areas within the deltaic plain were more suited to the cultivation of one type of crop than others. In the northern reaches of this region, in what would become the present-day parishes of West Baton Rouge, East Baton Rouge, East Feliciana, and West Feliciana, and on the land extending farther north along the Red River, planters encountered a cooler and drier climate.[3] "Though some other articles are produced and sent to market," wrote geographer William Darby regarding this area, "cotton may be viewed as the chief staple; it is here made of excellent quality."[4] Although several planters, such as the Barrow family of West Feliciana Parish, cultivated sugar cane, more often than not they found themselves worrying "for fear of ice."[5]

To the west of the Mississippi, in the parishes of Iberville, St. Landry, St. Martin, Lafayette, Vermillion, Iberia, and St. Mary, lay the richly fertile area known as the "Attakapas."[6] A visitor to this region in 1853 called it an "earthly paradise," and wrote that "/i/t would be almost impossible to describe its character, it is so composed of bayous, lakes, rivers, prairies, and impenentrable swamps."[7] Sluggishly-moving, darkly mysterious, Bayou Teche flowed through the Attakapas region, the alluvial deposits of its silty waters bestowing the richest area for sugar cultivation in Louisiana.[8]

Nearly rivalling the Attakapas parishes in total sugar production were the parishes nearest the mouth of the Mississippi. In Plaquemines and in the other parishes of this area were located some of the leading early pioneers in sugar manufacturing, among them Thomas Morgan, Theodore Packwood, and Judah Benjamin.[9]

In the south-central part of the Mississippi deltaic plain, and extending some 120 miles from the river to the Gulf of Mexico, lay the parishes bordering Bayou Lafourche. "A thousand years ago," wrote one historian recently,

> Bayou Lafourche served as the main channel of the Mississippi. But when the Mississippi shifted to its present course, it left a natural levee system that sets off the Lafourche region from other areas within the deltaic plain. Besides being the most recent, the Lafourche natural levees are the highest and widest, sloping back from the water's edge nearly three miles.[10]

A warm climate and a bayou navigable over its entire length drew many settlers to the Lafourche region and the parishes of Lafourche, Ascension, and Assumption. Although many of the early settlers cultivated cotton, by the 1830's many estates had increased to a point where sugar cane cultivstion proved worthwhile, and the Lafourche parishes "became the center of a prosperous sugar economy rivaling that of the river parishes."[11] It was on the eastern bank of Bayou Lafourche, in northern Lafourche parish near the present town of Thibodaux, that the tract of land which would become Laurel Valley was first cultivated in cotton. By the 1850's Laurel Valley Plantation ranked among the upper echelon of sugar production in the parish.[12]

The soils throughout this broad deltaic plain in southern Louisiana were continually renewed and replenished by the actions of the Mississippi and its bayou tributaries. Spring thaws in the Great Plains to the north meant that enormous quantities of runoff water made their way to the Mississippi and thence to the bayou country. While the natural levees (which themselves had been formed over centuries of repeated floodings) often contained moderate amounts of water, occasionally an exceptionally heavy amount of water would flow through the river and the bayous. The waters would flow over the levee banks, or often break through them entirely in a crevasse.[13] When this happened, large deposits of silt and soil were washed across the countryside. The repetitive action of this process gave a characteristic quality to the soil in the deltaic region. Fields located closest to the bayou were composed of coarse-ly-textured soil, since the heavier silt particles precipitated out of the bayou waters first. Farther from the bayou the soils became more finely-textured.[14] These variations in soil constituency, and the fact that the lands sloped slightly away from the built-up natural levees along the bayous, affected the manner in which the soil drained. If the underlying soil had a coarse texture, water drained through it easily. Away from the bayou, however, the soil particles "swell/ed/ upon wetting, closing up the larger pores through which the water was draining."[15] Thus as planters cultivated land farther from the bayou, where the gradient of the land was level

enough that excess water would accumulate on the surface, the need for a means of draining the soil became increasingly apparent.

The drainage problem became a topic of concern for Louisiana sugar planters during the early 19th century, when sugar prices were unstable and the necessity for turning a profit became even more critical. Reputedly the noted scientist Benjamin Silliman, delivering a lecture in New Orleans on agricultural chemistry, told his audience

> that if he were asked by what means the planter of Louisiana could, with certainty, add largely to the product of the soil, he would say, as Demosthenes said of action in its effects on eloquence, drainage, drainage, drainage.[16]

Planters sought advice on how to drain their soil and what the advantages would be for them if they did so. Many notices and articles on the topic of drainage appeared in the leading information source of the day for Southern planters, De Bow's Review. One of these articles appeared in 1846 and furnished a list of reasons for draining lands cultivated in sugar cane:

> 1st. It carries off all the stagnant water, and the excess of what falls in rain. 2d. It arrests the ascent of water from beneath by capillary action, freeing the subsoil from noxious substances, which, in undrained land, frequently impair the growth of deep-rooted plants. 3d. By keeping the soil porous, it allows the rain, instead of merely washing the surface, to penetrate through the particles of earth, thus carrying to the roots not only the elements of growth existing in the water itself, but dissolving those substances which enter into the composition of the plant, and which the roots are incapable of absorbing, except in a state of solution. 4th. The descent of the water through the pores of the earth is accompanied by a descent of fresh air to the roots, the water displacing the air which previously occupied the pores, and being followed as

> it runs through the ground by fresh air, which is so valuable in promoting a healthy growth of the crop. 5th. The soil gradually becomes looser and more friable: hard lumps of stiff clay disappear by degrees, crumble more freely, and offer less resistance to the plow. 6th. The coldness of the soil disappears, and ... the crops mature from ten to fourteen days earlier than they formerly did. Who can estimate the value to the sugar planter of such an addition to the time of the grinding season? 7th. It is equivalent to an actual deepening of the soil, the roots of plants being invariably arrested in their downward growth when they meet with stagnant water in the soil .... 8th. It is a necessary preparation for the effectual application of manure or other means of improving the soil, the efficiency of which is but partially felt in undrained land.[17]

Modern handbooks of sugar cane cultivation would add to this list the fact that soil drainage increases the beneficial actions of nitrogen-producing bacteria in the soil, since the organisms receive greater supplies of nutrients in which to metabolize.[18] Unhealthy cane from land improperly drained displayed stunted growth, weak coloration, and pale coloration, and was sure to yield only minimal amounts of juice. It is no overstatement to state that while drainage "was the life of vegetation," it also provided for the livelihood of the planter.[19]

The history of the lands which would become Laurel Valley Plantation began with the arrival of an Acadian settler, Etienne Boudreaux, about 1775. The Spanish authorities who at this time controlled the Lafourche region granted land to many Acadian settlers who wished to make a living for themselves in the province. These Spanish land

grants generally ranged small in size, the usual tract extending five arpents (one arpent equals 192 feet) along the bayou levee and reaching back some forty arpents from the waterfront.[20] The land provided everything for the Boudreaux family in its simple mode of living. The bayou offered fishing, the timberland behind the farm promised lumber and game animals for hunting, and the fertile soil provided ample opportunity for cultivating food crops (corn, okra, rice) and cotton. Sugar cane, the eventual symbol of Louisiana agriculture, had not yet given sufficient demonstration of its promise and was cultivated by few settlers in the area. The gentle slope of the natural alluvial ridge which ran along the bayou meant that for the Boudreauxs and for other small planters living along the Lafourche, land drainage posed no major problem; excess water simply drained off into the forests and swamps behind the farms.

Following the acquisition of the Louisiana territory by the United States in 1803, however, the agricultural picture changed in the Bayou Lafourche area and in other interior regions where small settlement had been the rule. A wave of planters from the lower South swept into the newly-acquired territory, hoping to make new lives for themselves and filled with visions of "agricultural wealth and profuseness nowhere else to be witnessed in the world."[21] These planters settled along the bayous, adding to their own holdings by purchasing the neighboring lands of small farmers.

In addition, wrote one historian,

> In the years after the acquisition ..., back lands (beyond the single depth) were offered for sale to the front proprietors at $1.25 per acre. Many planters accordingly enlarged their holdings.[22]

It was through these means of acquiring land from nearby small farmers and from the sale of swampland that Joseph W. Tucker, a recent arrival to the Lafourche region, managed to bring his original tract to some 5000 arpents by 1845. His purchases included the arpents of land along Bayou Lafourche belonging to the Boudreaux family.[23] Tucker, who began the cultivation of sugar on his land, which he named "Laurel Valley Plantation," found himself, like other large planters, faced with the problem of draining his fields.

Much like other sugar planters of his day, Joseph Tucker undoubtedly found it necessary to dig drainage ditches in his land to solve his drainage problems. Plantation ditches formed a network linked together with furrows, quarter ditches, lateral ditches, cross ditches, and main ditches or canals, all differing from one another in depth and width. On most plantations some adjacent waterway, such as a bayou, lake, or swamp, served as an outlet for the water drained from the fields.

Every year during plowing in February and March new furrows were dug by field gangs working the land

> until the canes are sufficiently forward to be earthed, when the fine soil between the rows /was/ gradually brought from their centres to the foot of the plant, thereby turning the row into as many ridges,

> and the space between them into so many drains sloping about one foot from the top of the ridges to the bottom, and emptying themselves in the cross ditches, which in turn run into the main drains made of sufficient capacity to carry rapidly away any quantity of water that may fall during the most rainy season.[24]

Larger drains and ditches were cut as needed. "In draining a plantation it is customary," reported an observer in 1849, "to cut parallel ditches about two hundred feet apart, from the front to the rear of the plantation, with cross ditches every six hundred feet."[25] Planters also formed certain ditches to serve special functions. To drain away the icy waters which seeped through the natural levees from the bayous onto the fields during the early spring, workers dug a deep ditch running along the entire front length of the field.[26] Other drains bordered the main road running through the center of the plantation, and the many cross-roads that divided the plantation up into lots measuring roughly four acres.[27]

Once the ditches and drains had been excavated, it became essential to maintain them. Several factors made this necessary. The steeply-sloping walls tended to cave in, blocking water flow. The growth of reeds and other aquatic plants and weeds in the drains slowed down the water flow and encouraged rapid siltation.[28] During the antebellum period at Laurel Valley and other plantations a special slave gang was responsible for clearing the drains. "Immediately after the business of one year is closed, and the holidays are at an end," wrote T.B. Thorpe in 1849, "one of the first things attended to ... is the clearing out of the ditches, that have become

choked up by vegetation in the course of the summer and fall months."[29] Using spades, hoes, and their bare hands, the slave gang cleaned out the drains in the fields, and navigated the larger canals and the bayous in pirogues and rafts to remove water lilies, logs, and other obstructions from the water.[30] The drainage gang also cleaned out the ditches during the summer months, when the preservation of the maturing cane became critical.

Although T.B.Thorpe surely exaggerated in comparing the "magnificence" of these "regular system/s/of deep and carefully-constructed canals" to "the renowned pyramids of Egypt,"[31] the drainage canal networks on many plantations did form impressive and extensive systems. Solon Robinson, visiting Ormond Plantation in 1849, reported to the American Agriculturist that

> To give some idea of the enormous amount of ditching upon a sugar plantation, I will state some items. There are upon this place near 100 miles of leading and cross ditches. The water of these is taken up by three leading canals, some three miles long, and large enough for a considerable boat, that lead the water back through the swamp to a bayou, and thence into Amite River and Lake Mannepas. Then, there is the levee and public road, a mile long, with a ditch on each side, and about 25 miles of plantation roads and bridges, all to be kept in order. The leading ditches, running from the levee in a straight line back to the swamp, are about three feet deep, and 80 to 100 feet apart, and all have to be cleaned out once or twice a year. The cross ditches are not so deep nor so near together.[32]

The new sugar planters who settled in Louisiana after 1803 continued to acquire new land and increase their plantation size. By 1830, however, nearly all the available arable land along the bayous

had been put into cultivation, and planters wanting to expand were left with little choice but to utilize land lying farther back from the bayous. Most of this land proved too low to drain by gravity, and it was continually threatened by inundation from the backwaters. Many planters therefore constructed protection levees around these low-lying lands and built pumping plants in the rear of their estate. Water drawn off the low lands through open ditches by the pumping plant was raised up over the protection levee and dumped into the backwater swamp.[33]

The earliest form of pumping plant to appear in Louisiana was the drainage or "scoop" wheel. Invented nearly two thousand years ago in Persia, the scoop wheel resembled an undershot water wheel but the flat-boards, "instead of being turned by the impulse of the water, were used to lift it."[34] The wheel rested atop brick or wooden piers and turned in a track formed of hewn stone, masonry, or brick, "the lower end of this track being open to the main drain, the upper end communicating with the river which is kept out when the wheel ceases by pointing doors, like the lock gates of a canal."[35] Mules or horses, walking a circular track, powered the earliest wheels in the state, but during the 1830's planters began switching to steam power. Among the first was Minor Kenner of Jefferson Parish, who employed an 8 hp high pressure West Point engine to turn his scoop wheel in 1837.[36]

By mid-century scoop wheels driven by steam had become increa-

singly common in the sugar region of Louisiana. T.B. Thorpe wrote that voyagers on the Mississippi would often notice, when gazing upon cane plantations, "far off, in the dark moss-covered swamp, the constantly-puffing steam, that so eloquently speaks of the industry of man."[37] Solon Robinson noted several in operation during his visit to the state in 1849, among them the scoop wheel owned by J.L. White and Seth Trufant in Plaquemines Parish:

> /They/ have a canal twenty-two feet wide, three feet deep, and three miles long, to lead water away from their steam-draining machine, by which only can the back part of the land, now in cultivation, be kept free from water, by an engine of 10 horsepower. The water is lifted from two to four feet by a paddle wheel twenty feet in diameter. This works only one day a week, burning a cord and a half of wood, except in uncommon wet weather.[38]

Robinson also envisaged a systematic approach to land drainage in which navigable canals would be cut through every plantation and "draining machines would empty the canals and keep the surface of land that is now ten or twenty feet below flood height ... in a perfectly dry and fit state of tillage, at a far less expense, per acre, than is now incurred by the present imperfect individual system."[39]

Several other forms of pumping plants were introduced into Louisiana after mid-century to deal with drainage problems on large plantations. These pumps shared several characteristics. They had to be capable of lifting large volumes of water a short distance, usually no more than a few feet. Other requisites were reliability and economy of operation. The latter proved especially important

since these pumping plants operated at irregular intervals, and often had to be ready for operation at a moment's notice.[40]

Rotary, plunger, and screw pumps appeared in Louisiana, but the most popular and widely-used pump in the state was the centrifugal pump, first introduced about 1850. These pumps featured several advantages over their contemporaneous models. Whereas other pumps employed valves which could easily be damaged by dirt or floating debris sucked into the apparatus, the hydraulic system characteristic of the centrifugal pump proved less liable to injury. This system consisted of an impeller which turned rapidly in an encased chamber, creating a centrifugal acceleration which drew the water into the pump and discharged it outward or upward through a discharge pipe. Since the only metal parts contained within the centrifugal pump were its bearings and its impeller, the pump proved cheaper to build than all-metallic plants.[41]

A final and very important determinant for the popularity of the centrifugal pump was its efficiency. "Efficiency" is the ratio of the amount of work accomplished in a machine's operation to the amount of energy expended during that operation. Obviously, the pump which offered the lowest energy requirements would prove most attractive to a Louisiana planter, for whom fuel often proved a difficult commodity to acquire when the swamps behind the plantation became depleted of wood. The earliest centrifugal pumps used for drainage in the state were "decidedly crude" in design since "great

difficulty was experienced in making a satisfactory joint with the suction pipe."[42] Pumps of this nature achieved at best efficiencies of less than 50 percent. In addition, even where joints could be fashioned securely, many pump designers failed to realize that the customary approach of employing straight suction and discharge pipes having a uniform diameter throughout, wasted energy and lowered efficiency. When manufacturers of pumps heeded the laws of hydraulics and discovered this energy loss, their corrected centrifugal pump designs achieved efficiencies of nearly 80 percent, a mark superior to other pumps used in Louisiana.[43] By 1920, when a tabulation of drainage plants was conducted in Louisiana during the census, 63 of the reported 71 pumping plants operating in the state relied upon centrifugal pumps or a combination of this and some other pump (e.g., rotary, screw).[44]

One form of centrifugal pump deserves special attention because of its wide use among Louisiana sugar plantations, including Laurel Valley. Known as the "Patent Twin Propeller Drainage and Irrigating Machine," or more simply the "Menge Pump" after its inventor, Joseph Menge, the pump first appeared during the early 1880's. A notice regarding the performance of the first Menge pump, erected by Bradish Johnson on Woodland Plantation in 1883, reported that it was

> raising and discharging a stream of water 16 x 24 inches at an elevation of 42 inches. The discharge opening being closed the Pump raised the water seven feet high in the box. The engine used a 9 x 12 cylinder.[45]

The Menge Pump consisted of a rectangular wood or concrete box surrounding an iron shaft set vertically into the water. At the end of this shaft an iron impeller, ranging in diamter from 8 to 20 inches, turned rapidly to create the centrifugal suction. Water rushed into the pump through openings in the pump box above and below the impeller. For low lifts one impeller proved sufficient, but for higher lifts two or three impellers were arranged on the same shaft. A belt or rope driver connected the pump to its power source, a steam or gasoline engine.[46]

Advertisements in sugar planters' directories and newspapers helped promote the acceptance of the Menge Pump for draining plantations and also for irrigating rice fields. One such advertisement, from 1892, claimed that 415 pumps had been erected in Louisiana, describing them as "simple in construction, light /in operation/, durable ... and not costly."[47] The pump received greater acceptance in the mid-1890's following Menge's receipt of an award at the 1893 Columbian Exposition. "In operation," read the award, "it is a free wheel in a square box, between the top and bottom suction ports with free and continuous delivery of water from each and all of the blades of the wheel into the box."[48] Providing an efficiency of better than 50 percent and capable of delivering up to 60,000 gallons of water per minute, the Menge Pump remained in service on many plantations through the 1920's until largely superceded by more efficient centrifugal pumps.

The history of pumping plants at Laurel Valley Plantation mirrors, in effect, the evolution of these systems throughout Louisiana. At one time or another, a drainage wheel, a centrifugal pump, and a Menge pump served the plantation, and traces of all of these still remain.

Although a pumping plant probably existed on the estate during the antebellum period, records from this time have not survived. During the Civil War a great deal of destruction was wrought upon the plantation, and it is likely that any drainage machinery may have been destroyed. After the war the heirs of Joseph Tucker leased the plantation for several years, slowly re-building it to its pre-war status. Among the first of many troubles to plague the owners was a series of devastating crevasses on both Bayou Lafourche and the Mississippi River in 1867. These floods, according to a plantation history, "entailed heavy additional expenses on the plantation, such as the erection of protection levees and drainage machines." An invoice from this year recorded the payment of $9.14 for "Brick of Boiler Furnace of Draining Machine."[49]

The drainage machine thus described was, in all probability, the drainage wheel which was situated in the rear of the estate adjacent to a large canal. Its brick piers and wheel-track survive, along with a brick retaining wall which held back the swamp-waters into which the wheel emptied. Estimates prepared by HAER architects during the 1978 recording project indicated that this wheel probably

measured from 10 to 15 feet in diameter, although former plantation workers claimed it may have measured 40 feet or more. It, like many other wheels, may have been horse-driven at first, but it was definitely steam-powered by 1900. Wood from the swamps was used to fuel the boilers for the steam engine, and coal was substituted when wood supplies ran low.

The drainage wheel remained in operation at Laurel Valley for several decades and it was still in use through 1910. Crevasses in 1903 forced proprietor J.Wilson Lepine "to put the draining machine at Laurel Valley ... in first class shape to fight water successfully."[50] This work, which cost over $1400, included repairs to the wheel-track and wheel-boards, and the erection of a new boiler and smokestack. The boiler and stack were destroyed after Laurel Valley ceased operation in 1926.

Laurel Valley's first Menge Pump had been erected about 1890[51] and the 1903 floods entailed the installation of a second pump. A number of these pumps were installed in the plantation canals by 1926. According to the 1910 plantation Diary a Menge Pump was "taken out of the canal to rebuild it and install it with the wheel."[52] It is presumably this pump whose shaft, pulley mount, and impeller remain at Laurel Valley. The order prepared by Lepine for the rebuilding of the apparatus in 1910 listed

> 1 pc shafting $2^{7}/16$ inches x 17 feet long
> 1 bearing above propeller that goes on shaft [53]
> Menge Pump propeller = 10 inches x 32 inches.

A few months after this work had been concluded, Lepine wrote

to the Menge Pump Company, saying that "we are now using one of them for draining purposes and if we had another draining plant to erect we would put in another of your pumps."[54] He followed up on this comment in 1911, securing a Menge Pump and a 15 horsepower Foos gasoline engine for the J.B. Himel tract.[55] The same year a 14 x 20 Atlas left-hand steam engine was installed to drive the Menge Pump near the old drainage wheel. Other Menge Pumps for Laurel Valley included a 10 x 32 pump erected in 1912 near the Laurel Valley Saw Mill (shortly before a disastrous crevasse flooded the plantation, destroying the year's sugar cane crop), and a small pump with two impellers erected in Bayou Lafourche in 1913. Lepine told the Menge Pump Company in 1921 that "we are now using three of them and ... we cheerfully recommend them as good and efficient pumps."[56]

The history of the most recent type of pumping plant to appear at Laurel Valley, the centrifugal pump, is more obscure than the accounts for earlier systems. According to the 1910 Diary workers excavated foundations for a new draining engine and carpenters took down some of the draining machine buildings to rebuild them.[57] An expense account noted the purchase of a draining machine. In 1911 it was reported that "the engineers and carpenters are erecting the gasoline draining machine at J.B. Himel" and that they built a shed to house this machine.[58] Presumably it was this shed that was listed in a 1922 inventory as "1 Drainage M. Bldg, $400," and it may well be the same structure which today houses two centrifugal pumps and

associated equipment. It is also possible that this building may have been erected in 1920, the year in which two centrifugal pumps were shipped to Laurel Valley.

The two pumps, measuring 15 inches in diameter, were type AED American Well Works models, described in a contemporaneous catalogue as "Low pressure, Single Stage, Horizontal Centrifugal Pump, direct connected to Engine, for total heads of 30 feet or less."[59] Two Venn-Severin type "10" 40 horsepower oil engines, supplied by the Commercial Electric Company in New Orleans, drove the pumps. Since "large internal-combustion engines of sizes above 25 Horsepower should be arranged for starting by air, /requiring/ a small air compressor arranged for driving force from the main engine or from a small auxilliary engine," according to a Department of Agriculture report on pumping plants[60], the engines came equipped with two 3 x 3½ air compressors, 2 automatic air starting valves, and one 2½ horsepower Bull Dog Gas Engine with magnetto and muffler.[61] An outside water tank fed water to the engines, and a large fuel oil tank in the shed provided engine fuel.

This pumping plant, according to a 1926 report, operated on a sporadic basis:

> Drainage is insured by a large pumping plant which delivers the rain water from the fields to a large canal cut through the swamps to des Allemands Bayou....Due to the proximity of the Draining Plant, which is located near their houses,arrangement has been made with E. Melancon and P. Landry so that in case of big rain necessitating the running of the pumps they at once fire the boilers and pumps so as to permit our crew to report for their watches

> and from the factory which is at a certain distance. The two mentioned tenants give their services without any renumeration.[62]

Laurel Valley experienced difficulty in operating this plant, and Lepine complained of great mechanical problems with the engines. Soon after the plantation ceased sugar production in 1926 the pumping plant was abandoned.

Notes

[1] Dr. Paul Leslie, "Laurel Valley Sugar Plantation" (Thibodaux, Louisiana: Historic American Engineering Record, 1978), p. 2.

[2] W.B. Gregory, "The Evolution of Low-Lift Pumping Plants in the Gulf Coast Country," (Washington: United States Department of Agriculture, Experiment Stations Office, 1916), p.4.

[3] J. Carlyle Sitterson, Sugar Country: The Cane Sugar Industry in the South, 1753 - 1950 (University of Kentucky Press, 1953), p. 14.

[4] Davis, Edwin Adams, Plantation Life in the Florida Parishes of Louisiana, 1836 - 1846 (New York: Columbia University Press, 1943), p. 5.

[5] Ibid., p. 308.

[6] Sitterson, p. 16.

[7] T.B. Thorpe, "Sugar and the Sugar Regions of Louisiana," Harper's New Monthly Magazine 7 (June - November 1849), p. 756.

[8] Sitterson, p. 49.

[9] Ibid., pp. 145 - 149 passim.

[10] Leslie, pp. 2 - 3.

[11] Sitterson, p. 14.

[12] Leslie, p. 8.

[13] Ibid., p. 3.

[14] Ibid.

[15] Roger P. Humbert, The Growing of Sugar Cane, rev. ed. (Amsterdam: Elsevier Publishing Company, 1968), p. 420.

[16] J.P. Benjamin, "Louisiana Sugar: Drainage of Sugar Lands," De Bow's Review 2 (1846), p. 328.

[17] Ibid., p. 329.

[18] Humbert, p. 420.

[19] J.P. Benjamin, "Louisiana Sugar: Culture of the Sugar Cane," De

Bow's Review 3 (1847), p. 246.

20 Sitterson, p. 47.

21 Thorpe, p. 750.

22 Sitterson, p. 48.

23 Leslie, pp. 7 - 8.

24 Benjamin, "Culture of the Sugar Cane," p. 245.

25 Thorpe, p. 755.

26 Benjmain, "Drainage of Sugar Lands," p. 328.

27 Sitterson, p. 113.

28 Humbert, pp. 402 - 403.

29 Thorpe, p. 754.

30 This practice continued well into the 20th century, with plantation work gangs performing the task of "ditching." At Laurel Valley Plantation, for example, it was recorded in 1915 that the "hoe gang" was cleaning water lilies out of the canals. (Laurel Valley Diary, 1915, 30 March)

31 Thorpe, p. 755.

32 Solon Robinson, "American Tour South and West, No. 6," in Solon Robinson, Pioneer and Agriculturist, vol II (1846 - 1851), ed. Herbert Anthony Kellar (Indianapolis: Indiana Historical Bureau, 1936), p. 165.

Compared to Ormond Plantation, the canal and bridge system at Laurel Valley Plantation was smaller, though still extensive, according to the Benson & Bell "Topographical Map of Laurel Valley Plantation Parish Lafourche" (New Orleans, c. 1895):

Bridges	front field 65
	back " 145
	total 210
Canals	7 miles in length
	20 ft wide
"	5½ miles in length
	10 ft. wide
Ditches	2 3/4 miles in length
	8 ft wide

Ditches	3 miles in length 7 feet wide
"	7¼ miles in length 6 feet wide
"	8 miles in length 5 feet wide
"	8½ miles in length 4 feet wide
"	3/4 mile in length 3 feet wide
"	½ mile in length 2 feet wide

Total length of Canals and Ditches 43½ miles.

33 W.B. Gregory, "Mechanical Tests of Pumps and Pumping Plants Used for Irrigation and Drainage in Louisiana in 1905 and 1906" (Washington: United States Department of Agriculture, Experiment Stations Office, 1907), p. 71.

34 "Drainage," De Bow's Review 3 (1847), p. 71.

35 Ibid., p. 74.

36 Levi Woodbury, Letter from the Secretary of the Treasury, Transmitting ... information in relation to Steam-Engines, &c., House Document 21, 25th Congress, 3rd Session (Washington, 1838), p. 306.

37 Thorpe, p. 755.

38 Robinson, p. 180.

39 Ibid., p. 178.

40 Gregory, "Mechanical Tests," p. 71.

41 Gregory, "Pumping Plants in the Gulf Coast Country," p. 18; Frederick H. Newell, "Irrigation on the Great Plains." Yearbook of the Department of Agriculture, 1896 (Washington, 1897), pp. 182-183.

42 Gregory, "Pumping Plants in the Gulf Coast Country," p. 18.

43 Ibid., pp. 18 - 19.

44 Irrigation and Drainage, ed. Roger D. Marsden, gen. supervision William L. Austin, vol. VII of Fourteenth Census of the United

States, Taken in the Year 1920 (Washington: Government Printing Office, 1922), table 9, p. 517.

45 A. Bouchereau, Statement of the Sugar and Rice Crops Made In Louisiana, 1883 - 1884 (New Orleans, 1884), p. 1-A.

46 Gregory,"Pumping Plants in the Gulf Coast Country," pp. 27-28.

47 A. Bouchereau, Statement of the Sugar and Rice Crops Made in Louisiana, 1890 - 1892 (New Orleans, 1892), p. 1-A.

48 Gregory, "Pumping Plants in the Gulf Coast Country," pp. 28-29.

49 Petition of Louis C. Bush; Invoice from Gossin's Store, in Lafourche Parish Clerk of Courts, "Joseph W. Tucker Succession Papers," No. 230 Probates. Lafourche Parish Courthouse, Thibodaux, Louisiana.

50 Laurel Valley Diary, 1903 (27 March). Nicholls State University Library Archives (Thibodaux), Laurel Valley Collection.

51 J. Wilson Lepine to the Menge Pump Company, New Orleans, 24 August 1910. Barker-Lepine Business Correspondence, Item 255, Box 44, Nicholls State University Archives (Thibodaux), Laurel Valley Collection. Hereafter cited as Barker-Lepine Correspondence, followed by item and box numbers.

52 Laurel Valley Diary, 1910 (10 February).

53 Barker and Lepine to the Menge Pump Company, New Orleans, 11 February 1910, Barker-Lepine Correspondence, Item 255, Box 44.

54 J. Wilson Lepine to the Menge Pump Company, New Orleans, 24 August 1910. Barker-Lepine Correspondence, Item 255, Box 44.

55 Laurel Valley Diary, 1911, listing of drainage improvements.

56 J. Wilson Lepine to the Joseph P. Menge Company, New Orleans, 6 July 1921. Barker-Lepine Correspondence (among materials which had not been put into inventory as of August 1978).

57 Laurel Valley Diary, 1910 (18 March, 11 April).

58 Laurel Valley Diary, 1911 (21 - 22 April).

59 The American Well Works, "Modern Practice in 'American' Centrifugal Pump Construction," Bulletin #104 (Aurora, Illinois, c. 1910). Eleutherian Mills-Hagley Foundation Library, Trade Catalogue collection.

60 P.E. Fuller, "Pumping for Irrigation on the Farm," Yearbook of the Department of Agriculture, 1916 (Washington, 1917), p. 515.

61 J. Wilson Lepine to the Commercial Electric Company, New Orleans, 6 September 1920. Barker-Lepine Correspondence (among materials which had not been put into inventory as of August 1978).

62 [?] to Morris Le Compte, 28 February 1926. Unnumbered record box, Miscellaneous Materials Relating to Laurel Valley, Nicholls State University Library Archives (Thibodaux), Laurel Valley Collection.

Bibliography

I. Manuscript Collections:

Nicholls State University Library Archives. Thibodaux, Louisiana
J. Wilson Lepine business correspondences, 1910 - 1926
Laurel Valley Letter Books, 1900 - 1910
Laurel Valley Diaries, 1903 - 1915
Laurel Valley Annual Balance Sheets, 1901 - 1914
Laurel Valley Log Books, 1908, 1922
Specifications for Venn-Severin Engines

Eleutherian Mills - Hagley Foundation Library. Wilmington, Delaware
American Well Works trade bulletin

II. Legal Records:

Lafourche Parish Courthouse. Thibodaux, Louisiana
Clerk of Courts, "Joseph W. Tucker Succession Papers," No. 230 Probates

III. Materials in the Possession of Private Individuals:

A. Boudreaux. Thibodaux, Louisiana
Photograph of Menge Pump at Laurel Valley

Mrs. J. Wilson Lepine, Jr. Thibodaux, Louisiana
Benson & Bell, "Topographical Map of Laurel Valley Plantation Parish Lafourche," (New Orleans, c. 1900)
Photographs of Laurel Valley (c. 1910)

IV. Government Publications:

Fuller, P.E., "Pumping for Irrigation on the Farm," Yearbook of the Department of Agriculture, 1916 (Washington, 1917), pp. 507 - 519.

Gregory, W.B., "The Evolution of Low-Lift Pumping Plants in the Gulf Coast Country" (Washington: United States Department of Agriculture, Experiment Stations Office, 1916).

_____, "Mechanical Tests of Pumps and Pumping Plants Used for Irrigation and Drainage in Louisiana in 1905 and

1906" (Washington: United States Department of Agriculture, Experiment Stations Office, 1907).

Marsden, Roger D., Irrigation and Drainage, under general supervision of William L. Austin, vol. VII of Fourteenth Census of the United States, Taken in the Year 1920 (Washington: Government Printing Office, 1922).

Newell, Frederick H., "Irrigation on the Great Plains," Yearbook of the Department of Agriculture, 1896 (Washington, 1897), pp. 180-191.

Woodbury, Levi, Letter from the Secretary of the Treasury, Transmitting ... information in relation to Steam-Engines, &c. House Document 21, 25th Congress, 3rd Session (Washington, 1838).

V. Monographs Relating to Laurel Valley:

Leslie, Paul, "Laurel Valley Plantation" (Thibodaux, Louisiana: Historic American Engineering Record, 1978).

VI. Directories:

Bouchereau, A., Statement of the Sugar and Rice Crops Made in Louisiana (New Orleans). Directories for 1883 - 1884, 1890 - 1892.

VII. Secondary Articles:

Benjamin, J.P., "Louisiana Sugar: Culture of the Sugar Cane," De Bow's Review 3 (1847), pp. 244-249.

_____, "Louisiana Sugar: Drainage of Sugar Lands," De Bow's Review 2 (1846), pp. 325-334.

"Drainage," De Bow's Review 3 (1847), pp. 65-79.

Thorpe, T.B., "Sugar and the Sugar Regions of Louisiana," Harper's New Monthly Magazine 7 (June - November 1849), pp. 746-757.

VIII. Books:

Davis, Edwin Adams, Plantation Life in the Florida Parishes of Louisiana, 1836 - 1846 (New York: Columbia University Press, 1943).

Humbert, Roger P., The Growing of Sugar Cane (Amsterdam: Elsevier Publishing Company, 1968).

Kellar, Herbert Anthony, ed., Solon Robinson, Pioneer and Agriculturist, vol. II (1846 - 1851) (Indianapolis: Indiana Historical Bureau, 1936).

Sitterson, J. Carlyle, Sugar Country: The Cane Sugar Industry in the South, 1753 - 1950 (University of Kentucky Press, 1953).

Addendum To:
LAUREL VALLEY SUGAR PLANTATION:
DRAINAGE PLANT
2 miles south of Thibodaux on
State Route 308
Thibodaux
Lafourche Parish
Louisiana

HAER NO. LA-1C

HAER
LA,
29-THIB,
1C-

PHOTOGRAPHS

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